REMARKS

Claims 1-29 are pending in this application, with claims 11-26 currently withdrawn from consideration. Claims 1 and 27-29 are amended herein.

Regarding the Restriction Requirement (Office action points 1-4).

Applicants affirm the election of Group I, claims 1-10 and 27-29, without traverse of the restriction requirement.

The abstract of the disclosure is objected to (Office action point 5).

The objection is overcome by the amendment to the Abstract.

Claims 1-10 and 27-29 are rejected under 35 U.S.C. 112, second paragraph, as indefinite (Office action point 7).

The rejection is overcome by the amendments to the claims.

In claim 1, line 1, "composed of" has been amended to –comprising–. In line 3, the recitation of "this polyolefin" has been amended. In line 7, the recitation of "the section cut in the mechanical direction" has been clarified by reciting –a section cut in the mechanical direction–. A similar amendment has been made regarding "the section cut in the direction perpendicular to the mechanical direction and in the thickness direction."

In claims 27-29, the recitation "which uses" has been replaced by –comprising–.

Claims 1, 2, 7, 9-10 and 27-29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (U.S. Patent No. 4,588,633) (Office action point 8).

The rejection of claims 1, 2, 7, 9-10 and 27-29 over Kono et al. is respectfully traversed.

In the rejection, the Examiner states: "it is noticed that the method of making the membrane by gel sheet process in the instant claimed invention is essentially the same as Kono's invention, and the Examiner takes Official notice that the orientation of the lamella crystals and membrane orientation function are either inherent physical properties of the membrane made by the gel sheet process, or obvious optimizations ...." That is, the rejection appears to be based on inherency due to the similarity of Kono's method to that disclosed in the present application.

Applicants note, however, that the method of making the present invention differs from Kono's method. In particular, the method of making the microporous polyolefin membrane of the present invention includes a thermal setting step, disclosed in the specification beginning on page 15, line 15. This step is stated to help "increase pore size and orient the crystal lamellas in the direction perpendicular to the planes running in parallel to the microporous membrane, although the mechanisms involved therein are not fully understood."

In other words, when the membrane is produced without thermal setting, orientation of the crystal lamellas does not occur. Without the thermal setting step, the membrane does not satisfy the requirement with respect to the angle of the crystal lamellas.

Further, without the thermal setting step, the pore size is not increased, so that the permeability of the membrane becomes disadvantageously low. This may be seen in the description at page 16, lines 10 - 13, of the specification showing that when the effect of the thermal setting is

little, the permeability of the membrane is not much improved.

The importance of the thermal setting step is also apparent from the comparison of Examples 1 and 2 with Comparative Example 1.

As described in original claim 11 (now withdrawn), the microporous polyolefin membrane of the present invention is produced by a method comprising the steps of (i) extruding the solution of polyolefin (A) or polyolefin composition (B) into a gel-like formed article; (ii) thermally setting the article; and (iii) removing the solvent.

In Examples 1 (see page 18, line 12, to page 19, line 16, and Table 1 of the specification) and 2 (see page 19, line 7-10, and Table 1 of the specification), a microporous polyolefin membrane is produced by this method.

On the other hand, in Comparative Example 1 (see page 19, lines 11-14, and Table 1 of the specification), a microporous polyolefin membrane is produced in substantially the same manner as in Example 1, except that the thermal setting is not conducted.

For the membranes obtained in each of Examples 1 and 2 and Comparative Example 1, the air permeability and directivity of lamellas to the direction perpendicular to the membrane (%) are summarized in Table A below.

Table A

		Example 1	Example 2	Comparative Example 1
Air permeability (sec/100cc)		165	84	550
Directivity of lamellas to the direction perpendicular to the membrane (%)	Section in the MD	92	95	38
	Section in the direction perpendicular to the MD and in the thickness direction	90	92	32

Table A clearly shows that the air permeability of the membrane obtained in Comparative Example 1 produced without thermal setting is disadvantageously low. This is because of the unfavorable orientation state of the crystal lamellas due to the absence of the thermal setting (see page 10, lines 2-6, of the specification).

As apparent from the above, the thermal setting step is extremely important in the production of the microporous polyolefin membrane of the present invention.

On the other hand, in Kono et al. '633, there is no description of a thermal setting step in the production of the microporous polyolefin membrane. Therefore, the membrane in Kono et al. does **not** inherently have the limitations of the presently claimed membrane. Rather, the permeability of the membrane of Kono et al. is disadvantageously low compared to the present invention.

Moreover, there appears to be no suggestion for such a thermal setting step in Kono et al., and it would appear that the importance of a thermal setting step is not recognized at all in the reference. Applicants also submit that the thermal setting step and the resulting limitations recited in the present claims are not "obvious optimizations to one of ordinary skill in the art", as asserted

by the Examiner.

Applicants therefore assert that claims 1, 2, 7, 9-10 and 27-29 are novel and non-obvious over Kono et al. '633.

Claims 3-6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (U.S. Patent No. 4,588,633) either individually or in view of Takita (U.S. Patent No. 5,051,183) (Office action point 9).

The rejection of claims 3-6 over Kono et al. and Takita '183 is respectfully traversed.

As noted in regard to the rejection of claims 1, 2, 7, 9-10 and 27-29 over Kono et al., the membrane of Kono et al. is completely different from the membrane of the present invention in that the membrane of Kono et al. is produced by a method including no thermal setting step, the thermal step resulting in limitations recited in the present claim that are not found in Kono's membrane.

The membrane of Takita '183 is produced in substantially the same manner as in Comparative Example 1 of the present application. That is, Takita '183 also does not disclose a thermal setting step as in the method of making the present invention. Takita '183 also does not appear to suggest or motivate such a thermal setting step, and there is apparently no recognition of the importance of the thermal setting step in the reference. Accordingly, the permeability of the membrane in Takita '183 is disadvantageously low.

Therefore, no combination of Kono et al. and Takita '183 would have a thermal setting step, and accordingly, no combination of Kono et al. and Takita '183 would be expected to produce a membrane having the limitations recited in independent claim 1, nor in dependent claims 3-6. Applicants therefore assert that claims 3-6 are novel and non-obvious over Kono et al. and Takita '183, taken separately or in combination.

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kono et al. (U.S. Patent No. 4,588,633) in view of Takita et al. (U.S. Patent No. 5,922,492) (Office action point 10).

The rejection of claim 8 is respectfully traversed.

As noted in regard to the rejection of claims 1, 2, 7, 9-10 and 27-29 over Kono et al., the membrane of Kono et al. is completely different from the membrane of the present invention in that the membrane of Kono et al. is produced by a method including no thermal setting step.

The membrane of Takita '492 is produced in substantially the same manner as in Comparative Example 1 of the present application. That is, Takita '492 also does not disclose a thermal setting step as in the method of making the present invention. Takita '492 also does not appear to suggest or motivate such a thermal setting step, and there is apparently no recognition of the importance of the thermal setting step in the reference. Accordingly, the permeability of the membrane in Takita '492 is disadvantageously low.

Therefore, no combination of Kono et al. and Takita '492 would have a thermal setting step, and accordingly, no combination of Kono et al. and Takita '492 would be expected to produce a membrane having the limitations recited in independent claim 1, nor those of claim 8. Applicants therefore assert that claim 8 is novel and non-obvious over Kono et al. and Takita '492, taken separately or in combination.

If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

Attached hereto is a marked-up version of the changes made to the by the current amendment. The attached page is captioned "**Version with markings to show changes made**."

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosures: Version with markings to show changes made

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE ABSTRACT:

Please amend the abstract as follows:

~~The present invention provides a microporous polyolefin membrane of novel structure, and also provides a method of producing a microporous polyolefin membrane of high permeability and novel structure.~~ ~~The~~ A microporous polyolefin membrane is formed by ~~the~~ fine fibrils, ~~composed of~~ comprising (A) a polyolefin having a weight-average molecular weight of 5×10^5 or more or (B) a composition containing ~~this polyolefin~~ component (A), connected to each other, and has micropores of 0.05 to 5μm in average pore size and crystal lamellas of ~~the polyolefin~~ component (A) or (B) being in a specific orientation state ~~inclined at an angle θ of 80 to 100° to the plane constituting the membrane account for at least 40% of the total lamellas both on the section cut in the mechanical direction and on the section cut in the direction perpendicular to the mechanical direction and in the thickness direction~~. The ~~method of producing the microporous polyolefin~~ membrane ~~comprises the steps of~~ is produced by extruding ~~the~~ a solution, ~~composed of 10 to 50 weight %~~ of component (A) ~~a polyolefin having a weight-average molecular weight of 5×10^5 or more~~ or (B) ~~a composition containing this polyolefin and 50 to 90 weight % of~~ in a solvent, into a gel-like formed article; thermally setting the article, with or without stretching, at least at the crystal dispersion temperature of ~~said polyolefin~~ component (A) ~~having a weight-average molecular weight of 5×10^5 or more~~ or ~~said composition~~ (B) ~~containing this polyolefin~~, but at melting point of ~~said polyolefin~~ component (A) ~~having a weight-average molecular weight of 5×10^5 or more~~ or ~~said composition~~ (B) ~~containing this polyolefin~~ plus 30°C or lower; and removing the solvent.

IN THE CLAIMS:

Please amend claims 1 and 27-29 as follows:

1. (Amended) A microporous polyolefin membrane with ~~the~~ fine fibrils, ~~composed of~~ comprising (A) a polyolefin having a weight-average molecular weight of 5×10^5 or more or (B) a composition containing ~~this~~ a polyolefin having a weight-average molecular weight of 5×10^5 or more,

said fibrils being connected to each other, wherein ~~its~~ the average pore size of the membrane is 0.05 to 5 mm, and the crystal lamellas of the polyolefin inclined at an angle θ of 80 to 100° to the plane constituting the membrane account for at least 40% of the total lamellas both on ~~the~~ a section cut in the mechanical direction and on ~~the~~ a section cut in the direction perpendicular to the mechanical direction and in the thickness direction.

27. (Amended) A battery separator ~~which uses~~ comprising the microporous polyolefin membrane according to Claim 1.

28. (Amended) A battery ~~which uses~~ comprising the microporous polyolefin membrane according to Claim 1 for its separator.

29. (Amended) A filter ~~which uses~~ comprising the microporous polyolefin membrane according to Claim 1.